

weight multiplied by 4.5. Armed with a convenient table of cube roots and plenteously available data, it will be found that this man is a departure from the average, but a departure in the opposite direction to that which would promise the concealment of much weight under a partially spherical and disproportionally small surface. In this country at least the average height of the youth from eight years of age to eighteen is  $4'3\frac{1}{2}''$  W, whereas the stouter child and adult above and below these ages is liable to possess smaller heights, such as  $4'2''$  to  $3'7\frac{1}{2}''$  W.

So far is this man's rate of heat-loss per estimated square metre of surface below the average, and so unlikely is it that direct measurements of his surface will lead to any compensatory change in the statements such as would bring it near to the average, that it might have been of value to direct special attention to his indisputable peculiarity. Had this been done, another peculiarity of his might perhaps have been brought to mind and have been found of interest, namely, that he is a veteran *habitué* of the calorimeter. It may be suggested, indeed, that this is the important fact inasmuch as it enabled him to sleep amidst these peculiar surroundings and modified atmosphere with unusual unconcern. That unconcern is truly a factor of some importance may perhaps be gathered from a consideration of the unexplained greater evaporation of water from the surfaces of the few women bold enough to enter the calorimeter. It might be suggested that there is no mystery in the fact that these ladies perspired unduly.

It is almost certain that this particular case might legitimately be used to illustrate the statement that sleep, like scientific literature, is sometimes profound although often not so. It is indeed a well-known fact that the excitability of the nervous system during sleep is a very variable value, and it is extremely probable that its variations are attended with changes in the "tone" of the skeletal musculature, and therefore with modifications in the quantity of concurrent metabolism. Once take this point of view, which is apparently not dealt with by the authors, who describe all alike as being in profound sleep, and it will, on sound grounds, be found that there is not one of these recorded cases that does not require some consideration in these terms. Thus it will be found that every individual with a metabolism during sleep that is below the average value by more than 5 per cent., awakes to a metabolism increased by from 26 to 63 per cent., whereas every individual with a metabolism in sleep greater than the average by more than 5 per cent. awakes to a smaller increase varying from 10 to 22 per cent. It is necessary to suggest that the one set awake to a relatively much greater increase of metabolism because they awake from a more profound state of slumber. Nor is the suggestion the less necessary when it is discovered that although several not infrequent visitors to the calorimeter are found on either side of the average, yet the initials of the best-known *habitués* are found in the heavy slumber class and those of certain restless probationers in the list of light sleepers.

J. S. MACDONALD.

#### NOTES.

In a four-column article which appeared in the *Times* of December 22, the outbreak of plague in East Anglia, and particularly the rat-infection in the locality, is dealt with ably and exhaustively. The writer of the article points out that no adequate measures have yet been taken to deal with the situation, and urges that it is one of national importance and for direct Government intervention. It is suggested that a sum of 10,000*l.* at the very least is required to prosecute the necessary inquiries and

investigations, and that there is immediate necessity for expert inquiry under Government control and at Government expense. Compared with the issues involved, the expenditure of such a sum, or even one many times larger, need not be considered, and the course of action recommended will commend itself to those who have a real knowledge of plague, and it is to be hoped that the authorities will speedily take in hand an organised scientific inquiry into the outbreak of plague in England and the remedy for its control. Similar views in outline were expressed in the article on "Plague" which appeared in *NATURE* of the same date (December 22, p. 237).

THE appalling loss of life associated with the terrible colliery disaster at the Yard Mine of the Hulton Colliery Co. at Bolton, Lancashire, has again emphasised the desirability of perfecting, so far as is practicable, the warning of approaching danger. The explosion, which occurred shortly before 8 a.m. on Wednesday, December 21, resulted in the loss of about 350 lives. The *Times* of December 22 says the disaster followed immediately upon a colliery warning, which appeared on Monday in newspapers circulating in various mining districts, and the warning was said to be in continuation of one which had been circulated a week earlier. Such warnings are not, however, issued by the Meteorological Office. With the advance made in recent years in our knowledge of weather changes, it seems desirable to determine the atmospheric conditions under which explosions generally occur, and, if possible, to place the warnings of approaching danger on a scientific basis and to make some public authority responsible for the issue of such warnings. The weather chart for 7 a.m. December 21 issued by the Meteorological Office is of quite a common type, and is representative of many such occurrences in the course of an English winter. A region of low barometer was situated to the south of Iceland, and a region of high barometer was situated over Germany. The barometer at this time was fairly steady at about 29.95 inches over Lancashire. Examining the atmospheric conditions under which fifteen of the greatest colliery disasters of recent years occurred, between the years 1880 and 1910, there is a preponderance of explosions with a high barometer, and about the time that the central area of an anticyclone is situated in the neighbourhood. There are, however, marked exceptions to this, and the disaster near Wigan on August 18, 1909, occurred when an area of low barometer readings was centred close by. Irrespective of the absolute height of the barometer, the instances examined seem to occur about equally with a rising and a falling barometer.

A BILL to make Paris official time coincide with Greenwich time was presented to the French Senate on December 21. The Bill was passed by the Chamber of Deputies several years ago, and has been approved by the senate committee and by the Cabinet, so that in all probability it will become law. Paris time is 9m. 21s. ahead of Greenwich time; and upon the day prescribed by the law, the clocks indicating official time in France will be put back by that amount. By the adoption of the change, France will be brought into the international system of Standard Time reckoning which is now followed in most civilised countries. On this system, the hour of each successive fifteen degrees of longitude, reckoning from the Greenwich meridian, is used for the Standard Time; hence the difference in time in passing from one zone to another is always an exact number of hours.

It was announced a short time ago that a new zoological garden in course of construction by Mr. Carl Hagenbeck in the grounds of the Villa Borghese, Rome,

would probably be opened on January 1. The grounds, which comprise twenty-eight acres, lie outside the old walls to the northward of the city, and it is stated that more than 40,000*l.* has been already spent on them, while the animals, some 1400 in number, represent another 10,000*l.* As at Stellingen, cages have been to a great extent dispensed with, deep ditches and scarped cliffs serving to confine the animals, which thus appear to be at liberty.

THE Zoological Society of London has elected the following corresponding members:—Mr. Roosevelt, ex-President of the United States; Mr. B. Basu, Calcutta; Mr. J. M. Doctor, Bombay; Dr. R. Dohrn, Naples; Prof. Ludwig von Graff, Graz University; Mr. W. H. Osgood, Washington, U.S.A.; Mr. H. Pam, Caracas; and Mr. R. B. Woosnam, Nairobi. Prof. E. Lönnberg, Stockholm, and Mr. S. H. Scudder, Cambridge, Mass., U.S.A., have been elected foreign members of the society.

WE learn from the *Chemist and Druggist* that the branch laboratories of the Pasteur Institute of Paris, at Garches, near St. Cloud, which are specially used for the preparation of anti-diphtheric and other serums, took fire a few days ago, and damage to the extent of 4000*l.* was done.

THE International Horticultural Exhibition which is to be held in the Chelsea Hospital grounds at the end of May, 1912, promises to have considerable scientific interest. There has only been one show of this nature in Great Britain, namely, that of 1866, which was held at South Kensington. Although the 1866 Exhibition was, in the end, a magnificent success, it very nearly proved disastrous to those responsible for the finances. The ultimate success was obtained by the committee prolonging the period the exhibition was open for public inspection, and the balance which resulted from this policy was devoted partly to the purchase of the Lindley library, at present housed in the Royal Horticultural Society's Hall at Westminster, and partly to making a donation to the funds of the Gardeners' Royal Benevolent Institution. In connection with the exhibition there was held an International Congress, and a valuable report of the proceedings was printed which is still a lasting record of the work and interest that were freely given by the horticulturists of that day. In 1912 a similar congress will take place, and subjects of international importance to the horticultural industry will be discussed in the presence of representatives from most of the European countries, America, and our own colonies. It is expected that the congress will consider the question of the regulation of insect pests and fungus diseases, and the effects of the prohibition of the importation of certain plants to certain countries, for instance, by the Phylloxera laws in the wine-producing countries. Certain other questions suggest themselves as ripe for discussion; for example, the improvements which have been effected in plants in recent years, the different methods by which those improvements have been obtained, and horticultural education, with special reference to the methods of training young horticulturists in this country and on the Continent of Europe and in America. A committee largely composed of scientific men has been appointed specially to promote the congress and a scientific section of the exhibition. The horticultural show itself is expected to be the largest ever held in this or any other country. There are already 431 competitive classes, and many of these are of scientific interest, but we must reserve any further remarks for a future occasion. Copies of the schedule can be obtained from Mr. Edward White, 7 Victoria Street, Westminster.

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MR. J. GRAY contributes to the December number of *Knowledge* an article on the measurement of perseverance and its value as an index of mental character. In point of fact, Mr. Gray does not measure perseverance, but the speed at which rapid flashes of colour just succeed in extinguishing flicker in various subjects. He assumes that the individual differences with which he meets are due to differences in the persistence of colour sensations, and that "this persistence . . . is identical, or very closely related, to a quality of mind which the psychologists call Perseveration." The experimental facts which the paper contains are two, viz. that flicker disappears more readily in women than in men, and perhaps more readily in dark-haired than in light-haired persons. The nature of these differences awaits careful psychological investigation.

IN the *Revue générale des Sciences* for October 15 and 30 Prof. Marinesco, of the University of Bucharest, has given an interesting summary of recent investigations upon the anatomical localisation of the human cerebral cortex, and more especially of the distinctive cytological characters of each of the multitude of areas into which the pallium of the brain can now be subdivided. His descriptions are elucidated by a series of twenty-seven drawings exhibiting a wealth of intricate detail. The articles are essentially a digest of the work accomplished by others, and especially of the classical researches of Oskar and Cecilie Vogt and Karl Brodmann. Although Prof. Marinesco's citations of the results and the opinions expressed by other anatomists are not always exact, on the whole his summary will be useful to those who are unable to find time to read the voluminous literature upon which it is based.

THE Journal of the Quekett Microscopical Club for November (ser. 2, vol. xi., No. 67) contains a critical paper on the classification of the Bdelloid Rotifera which should be of great value to students of this difficult group. The same number contains an interesting echo of the British Association's visit to South Africa in 1905 in the description, by Prof. G. S. West, of a remarkable new species of Volvox collected by Mr. Rousselet in Rhodesia. The adult colonies are about 1 mm. in diameter, and may contain more than 50,000 cells. Another paper also deals with the microscopic fresh-water fauna of Africa, being a contribution to the list of Hydrachnidæ found in the East African lakes, by Mr. Charles W. Soar. The material upon which this paper is based was collected during the third Tanganyika expedition conducted by Dr. W. A. Cunningham.

IN the *Centralblatt für Mineralogie, Geologie u. Paläontologie* for 1906, p. 450, Dr. O. Abel founded a new genus and species of bird (*Alabamornis gigantea*) on two bones from the Alabama Eocene, regarded by Dr. Lucas as the pelvis of a Zeuglodon, these bones being described as coracoids of the bird. Dr. Lucas wishes to state that there is no doubt whatever as to the correctness of his original determination, and that the bones in question have been mounted in their proper position in the Zeuglodon skeleton which is now exhibited in the U.S. National Museum. "*Alabamornis*" must accordingly be deleted from the list of fossil bird genera.

DR. F. A. LUCAS writes to say that the "Open Letter" of the Campfire Club on the fur-seals of the Pribilofs, which was referred to in *NATURE* some months ago, contains several misstatements, more especially the assertion attributed to the authorities that unless 95 per cent. of the males were annually killed the herd could not increase. In the Recommendations of the Advisory Board, of which

Mr. Lucas has enclosed a copy, the statement is "that not more than 95 per cent. of the three-year-old male seals be killed in any one year," which is, of course, a very different matter. Mr. Lucas adds that all male fur-seals over a certain size are not killed, but left to grow up, and that under the rules in force for the last five years the number of adult males has steadily increased, while the females have as steadily decreased, and will doubtless continue to do so if pelagic sealing be not stopped.

In a paper on animals in Glen Garry Forest, published in vol. vi., part iii., of the Transactions of the Edinburgh Field Naturalists' and Microscopical Society, Mr. Symington Grieve states that whereas half a century ago the sea-eagle was far more numerous in Scotland than the golden eagle, at the present time precisely the opposite of this is the case. The golden eagle, owing to the protection afforded to it by landowners, is increasing in numbers throughout the Highlands in suitable districts. On the other hand the sea-eagle, which formerly abounded on the cliffs of the west coast, has nearly disappeared, and in the author's opinion, in default of more efficient protection than it at present receives, will cease to breed in Britain within a few years. Mr. Grieve is also of opinion that the wild cat is on the increase in Scotland, owing to the instructions issued by proprietors and factors for its preservation.

In an article on the spawn and larva of the salamander *Amblystoma jeffersonianum*, published in the *American Naturalist* for December, Prof. W. H. Piersol directs attention to the low vitality of many of the eggs. Although no accurate census has been taken, it is estimated that under natural conditions three-fourths of the eggs do not live to commence gastrulation, and the same proportion of loss occurs in spawn kept in the laboratory. The egg does not die as a whole, but while some cells perish at an early period, others develop to a certain stage, only to die later. These dead eggs imbibe water and become larger than the rest, and in the natural condition become infested with a fungus. Since, however, this fungus does not make its appearance in spawn reared in the laboratory, it is manifest that the mortality is due to some other cause. On the other hand the spawn of the allied *A. punctatum*, both in the natural condition and in the laboratory, suffers practically no loss.

THE Live Stock Journal Almanac for 1911 contains the usual amount of valuable information regarding horses and pedigree stock of all kinds for 1910, together with a number of articles on subjects of current interest by various specialists. Sir Walter Gilbey, for instance, discusses the effect of the rapid increase of motor vehicles on the prices of horses, and finds that although fewer horses are required in this country than was the case ten years ago, yet prices in all classes are fully up to their old level. This affords evidence that the supply has fallen *pari passu* with the demand, and this, from a military point of view, is a serious matter. On the other hand, the demand for shire horses is fully maintained. In another article Lord William Cecil directs attention to the value of our mountain and moorland breeds of ponies, on account of their stamina and hardiness, and advocates that Government should take into consideration the advisability of breeding a serviceable class of horse from pony mares. In an article on the connection between the various breeds of British cattle and the nature of the soil on which they are reared, Mr. P. McConnell revives the theory that the red colour of Herefords is connected with the red

rocks of their native county. He forgets, however, to add that the Sussex breed is also red. Apparently he also believes that white park cattle are an aboriginally wild stock.

DR. GUIDO SALA (*Mem. R. Ist. Lombardo Sc. e Lettere, Classe Sc.*, xxi., fasc. iv.) has published some interesting observations on the cells of the ciliary ganglion. In the human foetus of six or seven months the cells are comparatively simple; they have few superficial prolongations (each ending in a bulbous enlargement), and a pericellular network is seldom present. At the time of birth the cells and their processes are larger, and six or seven months later loop-like outgrowths of the cell begin to appear, and later become more numerous, larger, and more complex. In adults there is a complex pericellular network of fine deeply staining fibrils, which completely envelops the cell, and there is often a spiral fibril round the axone. In old persons the cells exhibit modifications and assume almost the aspect of embryonic elements, and the protoplasmic processes of the cell are, for the most part, short and thick. In the same memoirs (fasc. iii.) Prof. Livini gives some notes on the development of the trachea in the chick. In embryos of about ninety-four hours' incubation the lower end of the trachea and the origins of the bronchi become narrowed and then occluded, but the lumen is restored before the one hundred and eighteenth hour of incubation. A little later the greater part of the trachea becomes similarly narrowed and temporarily closed.

AMONG thirty-one forms of lichen collected by Ir. M. Shegolef in the Jugjur chain (Stanovoi), *Umbilicaria caroliniana* and *Usnea cavernosa* are of special interest, as the former has been previously reported only from America and the latter only from America and India (*Bulletin of the Imperial Academy of Sciences of St. Petersburg*, No. 7, 1910). *U. cavernosa* seems to be widely distributed in eastern Siberia, for it is abundantly represented in Shegolef's collection.

AMONG ostracoda collected by D. Pedashenko in Issyk-kul is *Herpetocyprilla mongolica*, of a new genus which resembles *Candona* and *Eucandona* in the absence of swimming bristles to the second pair of antennae, but is very different in many other respects (*Travaux de la Soc. Imp. des Naturalistes de St. Pétersbourg*, vol. xxix., fasc. 2, part i.). Other new species are *Cypricercus mongolicus* and *Cytheridea pedaschenkoi*.

At the annual meeting of the Lancashire and Cheshire Entomological Society, held in Liverpool on December 19, Mr. R. Newstead, of the Liverpool School of Tropical Medicine, delivered his vice-presidential address on "Some Morphological Characters of the Genus *Glossina*." He stated that he has made a careful examination of the armature of the males of all the hitherto described species of the genus *Glossina*, and it has not only revealed some very striking morphological characters, but has led to the discovery of three hitherto undescribed species:—*Glossina submorsitans*, Newst.; *G. brevipalpis*, Newst.; and *G. fuscipes*, Newst.; and the re-establishment of Bigot's *G. grossa*. The scheme of classification adopted is based entirely upon the taxonomic characters of the male armature, which are the true and almost only natural anatomical elements that can at present be found in these insects. Mr. Newstead has found that the species fall into three striking and distinct groups, each being separated by very trenchant characters. The groups are:—(1) The *fusca* group, including the four largest species of the genus: *G. fusca*, Walker; *G. grossa*, Bigot; which have a western distribution; *G. longipennis*, Corti;

and *G. brevipalpis*, Newstead. (2) The *palpalis* group, to which belong the species: *G. palpalis*, Rob.-Desv.; *G. tachinoides*, Westwood; *G. fuscipes*, Newstead; and *G. pallicera*, Bigot. (3) The *morsitans* group, comprising *G. morsitans*, Westwood; *G. submorsitans*, Newstead; and *G. longipalpis*, Wiedemann. In these three groups forms occur which are so widely different as to lead one to assume, without taking the other external features into consideration, that they represent three distinct genera. Certain it is that these insects illustrate one fundamental principle of evolution, namely, that they have attained great development of one set of morphological characters, and have retained others apparently of an ancestral type.

THE difficult question whether acquired characters can be inherited is discussed by Dr. Hugo Fischer in the issue of *Naturwissenschaftliche Wochenschrift* for November 20 and the following number. Examples among unicellular organisms are accepted in the cases of the sporeless races of fission fungi and the colourless variety of *Micrococcus prodigiosus*; also the chromatic modifications of *Oscillaria* and the physiological varieties of numerous *Uredineæ* and *Ustilagineæ* are cited as good instances. Amongst animals, the author notes the experiments of E. Fischer and others, who produced more than transitory changes of colour in butterflies by subjecting the pupæ to abnormally low temperatures, and Kammerer's results with salamanders. In the case of flowering plants, the author holds that the Alpine forms of larch and pine and Wettstein's seasonal forms of *Euphrasia* and *Gentiana* are not definite examples, but admits the races of maize produced by Blaringhem and the modified type of *Sempervivum* raised by Klebs. The essential factor appears to be a disturbance of the metabolism.

A COPY of the annual report for 1909, dealing with technological museums, has been published by the Technical Education Branch of the Department of Public Instruction of New South Wales. The report is an excellent record of steady progress. A considerable number of exhibits were added to the collections during the year. The display of polished marbles and building stones of New South Wales in the museum at Sydney has been largely added to, and the whole now makes a fine exhibit. For comparative purposes, slabs of the principal foreign marbles have been displayed upon the walls in an adjoining court. To increase the available knowledge of the constructive value of the building stones, a special collection was obtained from various parts of the State, and prepared for testing at a 100-ton machine. Fire and water tests upon specially prepared cubes were next undertaken upon the sandstones, trachytes, marbles, and granites. The location of deposits of building and ornamental stones occurring in the area included in the Federal capital site was determined, and specimens of these materials procured. The data obtained, together with a specially constructed map, were published as an appendix to the second edition of the museum's work on the "Building and Ornamental Stones of New South Wales." The public-school teachers of the district take advantage of the facilities offered by the museum in the furtherance of nature studies; 1567 specimens were identified for teachers during the year, not including those brought to the museum by teachers and pupils; 865 specimens were supplied from duplicate collections to assist the teachers in the formation of school museums. Specimens were identified and classified for a large number of schools throughout New South Wales.

MRS. M. OGILVIE-GORDON continues her studies of the Triassic masses above the Grödenal, in Tyrol, in the  
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*Verhandlungen der k.k. geol. Reichsanstalt* for 1910 (pp. 219 and 290). In 1908 she visited the Boégipfel region with Prof. Rothpletz and Herr von Klebelsberg, and verified the overthrust of Raibl beds on Dachstein dolomite. Neocomian strata were found resting on Jurassic north and south of the Eisseespitze; these lie below the overthrust. The sections of the Boe and Jägerschart masses show remarkable discordances due to thrusting, even among the Jurassic strata, and the Upper Triassic beds climb up boldly on the crests. Similar overthrusting has been studied by the author in the Sella and Langkofel area (Trans. Edinburgh Geological Society, 1909-10). In the second paper in the *Verhandlungen* the discovery of fossiliferous Cassian beds is recorded from under the Burgstall, a part of the Schlern mass where a dolomitic and contemporary facies was believed to exist. The dolomite on this level farther west is attributed by the author to the occurrence of an overthrust, whereby the Cassian horizon is brought above a wedge of the Schlern dolomite, which properly should overlie it, as it is seen to do on the Gamsteig and the Burgstall.

THE *Geologische Rundschau* (Leipzig: Engelmann), which was recently started as a journal of general geology, continues on the broad lines laid down by its originating society. Prof. Steinmann, for instance, describes and illustrates in parts ii. and iii. the structure of the Cordillera of South America. M. Semper summarises seventy papers on the "Klimaproblem der Vorzeit," a labour that will surely rejoice his fellow-members. P. Wagner furnishes a list of 127 German works and papers bearing on geological teaching in schools and on the treatment of geology so as to promote interest and observation. His introductory essay of sixteen pages reminds us that the main object of the *Rundschau* is to bring the geological features of Germany and Austria to the front in public education. It is clear from his review that there is already a healthy movement to draw even scholastic mineralogy out of the old grooves of dry description. In part iii. W. Meigen reviews recent work on the origin of dolomite, and J. J. Sederholm discusses twenty-three papers on the pre-Cambrian rocks of Fennoscandia. E. Dacqué deals with the Jurassic strata formed by transgression on the "Lemurian continent," that is, in the region between New Zealand, East Africa, and India. In part v. J. Koenigsberger discusses the earth's age, and F. Pockels the bearing of earthquake research on the nature of the earth's interior. It is clear that these reviews of geological progress, written by specialists, make the *Geologische Rundschau* a very welcome addition in all libraries of a scientific character, as well as in many private homes.

THE Geographical Pictures published by Messrs. A. and C. Black for use in schools furnish selected views of typical land features for study. Twelve of these, illustrating various forms of valleys, have just been issued in Series x. as half-tone prints of selected photographs, about 16×12 cm. Notes accompany them suggesting various problems for study. A reference to the contoured map-sheet on which the feature is represented would further enhance their educative value.

COPIES of the Tide Tables issued by the Canadian Government for the Pacific and the eastern coasts of Canada for the year 1911 have been received. For the former, tide tables are given for six stations, and from these the tides at numerous stations can be determined. The results given are largely based on the observations of 1909, when twenty recording gauges were in simultaneous operation

throughout British Columbia; besides these, however, observations for six years are available at Sand Heads station, and for shorter periods at the others. On the eastern coast longer periods are available, and the tables for Quebec are based upon observations extending over thirteen years. It is claimed that the tables for Quebec, Father Point, Halifax, and St. John are now superior to those of any other harbour on the Atlantic coast of North America.

We have just received Water Supply Papers Nos. 245, 247, 250, 251, and 237, 239, published by the United States Geological Survey, in addition to the papers of the same series referred to elsewhere (p. 283). The first four papers deal with the surface waters of the Missouri and Lower Mississippi Basin, the Great Basin, and California, and record the gauge readings and discharge measurements made in 1907-8. Covering as they do a large area where rainfall is slight, the results are interesting, though, of course, they extend over a short period only, and are intended to be a preliminary investigation. River velocities are determined by the Price current-meter, which is almost exclusively employed by the Survey, and in this way results of much value are obtained rapidly and from a very wide area. The other two papers treat of the quality of the surface waters of Illinois and California, especially with regard to their potability and their suitability for industrial purposes.

In the last number of the Proceedings of the Royal Society (vol. lxxxiv., A, No. 572) is an important memoir by Sir George Darwin on the tidal observations made during Sir Ernest Shackleton's Antarctic expedition of 1907. The observations are shown by Sir George Darwin to demonstrate a tidal seiche in the Ross Sea, and from its period Darwin concludes that the sea extends far beneath the Great Ice Barrier into the Antarctic continent, passing to the east of the Pole and for at least 10° of latitude beyond it. He remarks that if this arm of the sea extends across Antarctica to the Weddell Sea the seiche would be much as the tidal observations indicate. It was remarked in a note in NATURE of May 12, on the expedition by Lieut. Filchner, whose plan is based on the assumption that Antarctica is divided into two parts by a sound connecting the Ross Sea with the Weddell Sea, that if the theory be correct some evidence in its favour should have been forthcoming from the tidal observations. Sir George Darwin's memoir shows that the tides offer striking evidence in favour of the direct connection between the Weddell and Ross Seas.

AMONG several useful papers in the Journal of the Scottish Meteorological Society for 1909 (recently published) there is one of especial interest by Dr. G. A. Carse and Mr. D. MacOwan giving a brief *résumé* of the more important facts connected with atmospheric electricity. Descriptions are given of some of the earlier methods of detecting the phenomena, and of Lord Kelvin's water-dropping apparatus, which is most widely used for measuring the atmospheric potential. Observations show that, in general, this factor varies with the time (there being in most places a diurnal and annual variation), and that, generally speaking, it increases in proportion to the distance from an extended horizontal surface if the distance between the points is not too great. It has, however, been found by balloon ascents that in fine weather it diminishes with height above ground, thus indicating that electrification is largely confined to the lower levels of the atmosphere. The annual variation has a maximum about mid-winter and a minimum in summer, but the periods of the diurnal variation are much more complex.

Another factor of importance is the ionisation of the atmosphere, and this is now being investigated more thoroughly. A few of the more interesting of the various theories accounting for the phenomena of atmospheric electricity are briefly sketched, but, so far as known, none has yet been promulgated which sufficiently explains all the observed facts.

To the *Rendiconti R. Accad. Lincei* of October 2 Dr. Eredia communicates an interesting paper on the cold period of June in Italy. This cold period has already been shown to exist over a large part of Europe, and to be due to the mean distribution of pressure at that period. But as Italy possesses a valuable series of observations available for the purpose, the author has taken advantage of them to show that this cold period in Italy constitutes a real climatological factor. His tables show differences of the ten-day means of temperature from each other between the third decade of May and the first decade of July, for 120 stations, for the period 1866-1906. He also gives a map showing by various shadings the difference of temperature between the first and second decades of June for different regions. These clearly show that generally there is a considerable fall of temperature in the second decade of June, that it is much more marked in Upper than in Lower Italy, and is considerably influenced by geographical configuration.

An interesting article by Dr. J. Mascart on actinometry and on meteorology at Teneriffe is published in the *Revue générale des Sciences* of November 15. The author points out that in the determination of the solar constant a difficulty arises at the outset; according to the definition, the receiving surface should be theoretically *black for all radiations*, having the properties of an integral radiator. Strictly speaking, this preliminary problem has not yet been solved. He described the so-called "absolute" instruments in use, which may be divided into two groups:—(1) calorimetric actinometers, which contain a liquid of known specific heat, of which that by Pouillet is the oldest; (2) those in which the electric energy necessary to produce the same effect as the solar radiation is measured; to this class belong the actinometers of Angstrom and Féry. The Solar Committee has adopted as a type Angstrom's compensation pyrheliometer. This decision is excellent as regards uniformity of observations, but might be harmful if it diminished the number of measurements with other apparatus. Reference is made to the observations made by the late Dr. W. Marcat and others on the extreme dryness at times of the Peak of Teneriffe, and on the electric phenomena there which seem to be connected with the former. The author considers the peak to be particularly favourable for observations on atmospheric phenomena and their connection with actinometry; also for observations of terrestrial magnetism. He thinks that more attention should be given to observations of zodiacal light, crepuscular rays, and atmospheric polarisation; these subjects are generally omitted from meteorological text-books because they are supposed to have no immediate connection with meteorology, but with this view he does not agree.

In a communication made to the Illuminating Engineering Society on December 9th Prof. G. W. O. Howe showed that the darkening of the glass bulbs of Osram lamps sometimes noticed is due to the use of a slight amount of copper in the leading-in wires. This copper appears to be projected from the point at which the filament is joined to the negative leading-in wire, and forms on the inner surface of the bulb a distinct shadowgraph of

the glass stem and wire supports of the filament. It is obvious that the use of copper, even in small quantities, in the leading-in wires of these lamps must be avoided.

THE device of doubling a wire on itself before winding it into a resistance coil reduces the inductance of the coil to a very small quantity, but unfortunately introduces a considerable capacity, which is equally undesirable if the coil is to be used in alternating-current measurements. Chaperon's method of winding the coil in sections, in each of which successive layers are wound in opposite directions and the magnetic area of each layer made the same, reduces the capacity considerably, but the more recent suggestion to balance residual inductance and capacity has been taken up by Dr. E. Orlich, of the Reichsanstalt, with marked success. He winds one layer of wire on a slate slab 5 by 12 centimetres and 3 or 4 millimetres thick with rounded edges, then places bridges over the edges and winds the second layer over the bridges. The distance between the two layers of wire is calculated so as to make the capacity and inductance equal for frequencies not very high. The results of the calculations are tabulated for resistance coils exceeding 3000 ohms, below which the method is not applicable.

WE have received from Messrs. J. J. Griffin and Sons, Ltd., a new edition of "Scientific Handicraft." The volume, which contains more than one thousand pages, forms a very comprehensive catalogue of physical apparatus. Messrs. Griffin, in addition to supplying all that is most recent for advanced work in the physical laboratory, include in their list apparatus which is suitable for many technical industries. The catalogue is also issued separately in three parts, the first part dealing with laboratory fittings and apparatus for general physics, the second part with heat, light, and sound, and the third part with electricity and magnetism. The book is well illustrated, and is furnished at the end with tables of physical constants. It will no doubt find a place in all physical laboratories as a book of reference.

IN a paper on the winning of coastal lands in Holland, read by Mr. A. E. Carey before the Institution of Civil Engineers on December 20, some interesting facts were given with reference to the gradual reclamation of the Dutch lowlands from the sea. The principal reclamations, which have so largely altered the map of Holland, were described, particularly that of the Lake of Haarlem, the first reclamation of which was carried out between the years 1540 and 1648. The so-called lake consisted of a vast swamp. The final works of reclamation were carried out by the State in 1840. Several of the breaches in the sand dunes on the North Sea coast appear to represent former embouchures of the River Rhine. The level of Amsterdam Peil, worked to by the Dutch engineers, differs only by about 1 foot from the level of the Ordnance datum. Some interesting facts ascertained in connection with the borings for the water supply of the City of Amsterdam were cited to show the delicate balance in water pressure which exists in the substrata of the Dutch fenlands. The gradual weakening of the natural protection afforded by the sand dunes was referred to, and some interesting evidence was brought forward to show how great the alterations in the position and magnitude of the dunes have been. Changes in location of the sand dunes are arrested by the planting of grasses on the faces of the dunes, and the protection of them on the land side by the planting of various kinds of trees. The controversy proceeding in Holland as to the best procedure in carrying

out the project for the reclamation of the Zuyder-Zee, which involves the reclamation of 1,500,000 acres, was mentioned. Briefly, the alternative schemes are:—(1) to close the inland sea by a reclamation dam running from Wieringen to the coast of Friesland, near Piaam, thus shutting out the North Sea from the area to the south, the reclamation works being effected at leisure in the lake which would then be formed behind the dam; (2) to carry out the series of smaller reclamations before the closing of the entire sea.

THE report of the Clifton College Scientific Society for the year 1909-10 has been received. We are glad to find that useful practical work continues to be done in the various sections into which the society is divided. An interesting series of notes on the birds of the Clifton neighbourhood, arranged chronologically, is published with the report.

### OUR ASTRONOMICAL COLUMN.

THE SPECTRUM OF THE AMERICA NEBULA.—In a paper published in the *Sitzungsberichte der Heidelberger Akademie der Wissenschaften* (1910, No. 27) Dr. Max Wolf discusses spectrograms of the America nebula taken during October. The spectra were photographed with the Zeiss spectrograph, having two U.-V. prisms, attached to the Heidelberg reflector.

Referring the emission lines of the nebula spectrum to several Fraunhofer lines occurring in the stellar spectra shown on the same plate, Dr. Wolf finds for the former the following wave-lengths:—434, 412, 406, 389, 383, 373, and 343. Of these the chief lines occur at 410.2 (412), 383.7, 372.7, and 344.8  $\mu\mu$ , the line at  $\lambda$  373 being by far the brightest.

THE MOVEMENTS OF CERTAIN STARS, IN SPACE, COMPARED WITH THAT OF THE SUN.—As an extract from the November *Bulletin Astronomique* we have received a paper in which Dr. P. Stroobant shows that the sun is probably a unit in a stream of stars moving through space in the same direction with a common velocity. As a primary index he takes those stars of which the movements, relative to the sun, are small, and then reduces their movements to a common plane.

The result is certainly striking, for Dr. Stroobant shows that the seven stars  $\alpha$  Cassiopeiae,  $\beta$  Persei,  $\alpha$  Persei,  $\alpha$  Scorpionis,  $\gamma$  Cygni,  $\epsilon$  Pegasi, and  $\alpha$  Pegasi are all travelling towards a polar area of only  $14^\circ$  radius, with velocities ranging between 11 and 22 km.; towards the centre of this area the sun is moving at a rate of 19.4 km. The probability that of the 105 stars brighter than magnitude 2.5 seven should, accidentally, show this common motion, is very small, but it must be borne in mind that the data on which the result is based are, especially in the case of parallax, open to corrections.

Dr. Stroobant suggests that, with the accumulation of further, more trustworthy, data, other stars may be found to belong to the same stream, and he cites  $\gamma$  Pegasi,  $\gamma$  Persei,  $\zeta$  Geminorum,  $\alpha$  Hydrae,  $\epsilon$  Leonis,  $\eta$  Leonis,  $\psi$  Ursae Majoris,  $\eta$  Virginis,  $\gamma$  Aquilae,  $\alpha$  Pavonis, and  $\eta$  Pegasi as stars having small proper motions, and of which the radial velocities relative to the sun are also small.

THE ITALIAN OBSERVATORIES.—In the *Rivista di Astronomia* (Turin) a series of articles is appearing describing in detail the various Italian observatories. In No. 10 Signor C. H. Loviselmi gives an excellent description of the observatory of the Roman College. The account gives the history of the observatory, describes the buildings and instruments, and gives short accounts of the various observers; it is illustrated with photographs of the buildings and portraits of Vico, Secchi, Ferrari, and Tacchini.

ASTRONOMY AT THE BRUSSELS EXHIBITION.—An interesting account of the astronomical exhibits at the Brussels Exhibition is given by Dr. Stroobant in the *Bulletin de la Société astronomique de France*, and now published as